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THE PLANT DISEASE REPORTER

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Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

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September 15, 1940

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXIV Number 17

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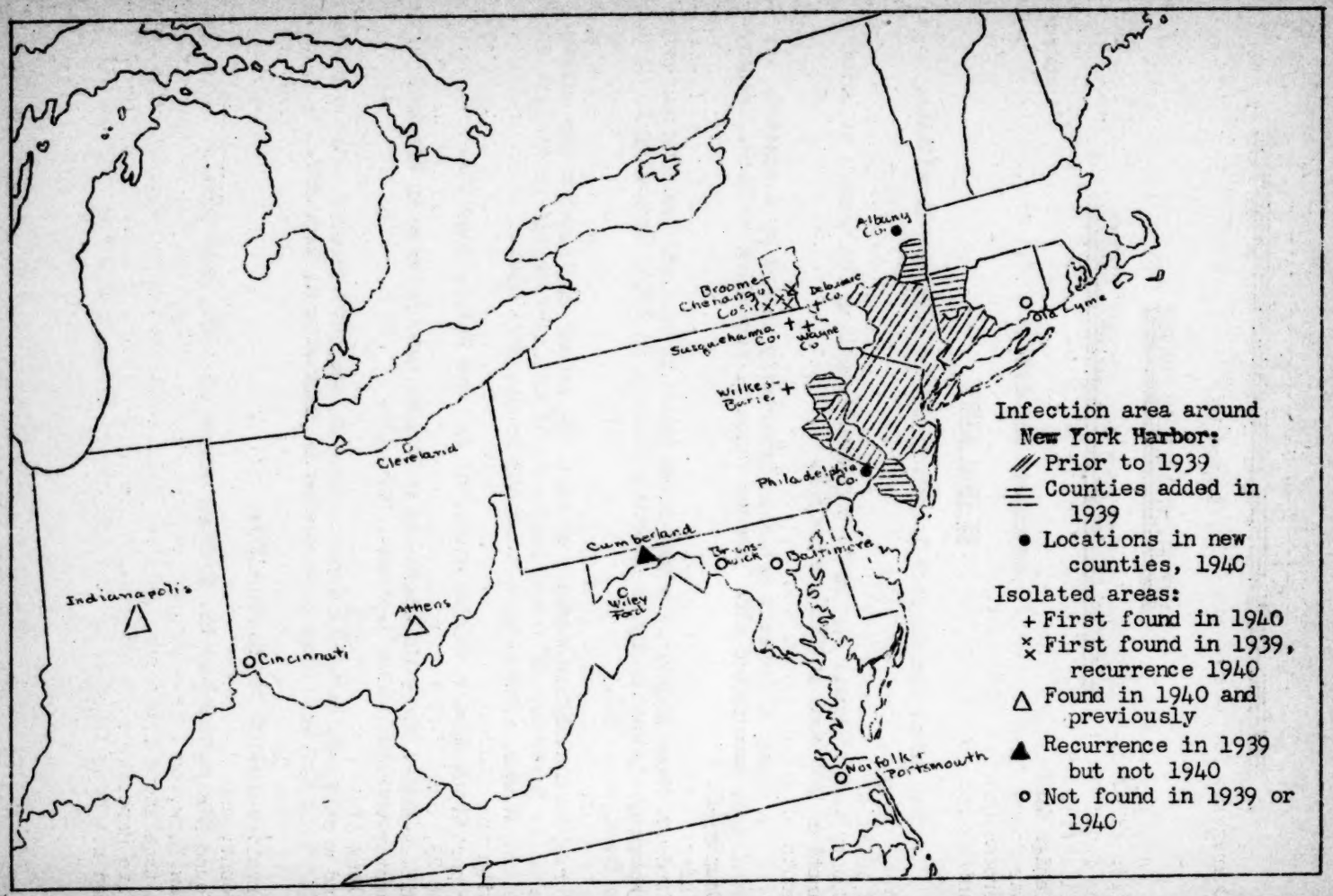

Places where Dutch elm disease has been found in the United States.

PRESENT STATUS OF THE DUTCH ELM DISEASE

(Compiled from weekly reports of the Bureau of Entomology and Plant Quarantine for the period September 10, 1939 to September 7, 1940).

1939: A compilation to September 9 was given in the Reporter (23: 287-288), which reported the Dutch elm disease (Ceratostomella ulmi) as found for the first time during the year in the following counties: Litchfield in Connecticut, Columbia and Broome in New York, Monroe and Lehigh in Pennsylvania, and Burlington in New Jersey. Later, the disease was found for the first time in southeastern Chenango County, adjoining Broome County, and additional infections were found in Broome, Columbia, and Monroe Counties (September 16 and 23).

1940: The infection area around New York harbor was extended into 2 additional counties by the discovery of a diseased tree in Philadelphia County, Pennsylvania, about 50 feet from the Bucks County line, and another in Bethlehem Township, Albany County, New York, about 5 miles south of Albany (April 20, August 24).

In Connecticut, the disease was found in 4 more towns in Litchfield County--Harwinton, Bethlehem, New Milford, and Torrington (August 17, 31). Infected trees were also found for the first time in the towns of Wallingford and Waterbury in New Haven County, and Bethel in Fairfield County (February 3, August 17).

Only a few diseased trees have been found in Burlington County, New Jersey, all in the northern end.

A new outlying area of infection has been found in Pennsylvania, with the discovery of 4 diseased trees at Wilkes-Barre in Luzerne County reported August 24. Additional trees found later brought the total number to 23, including one in Kingston directly across the Susquehanna from Wilkes-Barre. The infected trees in this area are largely located in one center where the elms have been weakened by the construction of a new dike along the river. Scolytus is very abundant in this area and extends south and west in the river valley (August 24, 31, September 7).

The Broome-Chenango County area in New York as known at present involves about 325 square miles, including the eastern half of Broome County and the southeast corner of Chenango County. No Scolytus has been found here. Two recent confirmations extend the area into Delaware County, New York, by a tree at Hancock, and Susquehanna County, Pennsylvania, by a tree above Lanesboro. Another tree in Wayne County, Pennsylvania, opposite Hancock, may also prove to be an extension of this area. The disease had not been found previously in any of these 3 counties (August 31).

Some diseased trees were found in the Indianapolis and Athens areas as in previous years, but none were reported from other outlying areas.

Number of diseased trees. The number of diseased trees reported during the entire period is as follows:

Connecticut	318
New Jersey	2653
New York	657
Pennsylvania	166
Indianapolis and Athens	10
Total	3804

THE STATUS OF ONION BLOAT IN 1940

A. G. Newhall and B. G. Chitwood

Excessive precipitation in the early summer of 1940 may have been responsible for an increase in the number of onion fields infested with the nematode Ditylenchus dipsaci (Kühn) Filipjev (causing a disease called onion bloat) in Madison County, New York, where the early crop from sets is the principal muckland crop grown. Surveys in late July and August revealed infested bulbs in 4 fields where the nematode was believed to have been absent in 1939. One of these was in a field, part of which had been steam sterilized in 1932 and which had been regularly inspected and found disease-free since then.

The fact that most of the fields had been flooded in May, and that most of the new infestations were found near the ditch banks suggests that flood waters may have contributed to the spread. This is supported by the fact that some infested bulbs probably did remain in one or two fields at the end of the 1939 season, and that some growers make a practice of pulling their seeders and laying them in piles on the ditch banks. A diseased plant could thus easily be the source of infestation for some field at a considerable distance.

There is the possibility that one of the numerous weeds growing in the ditches may be harboring D. dipsaci, and in flood time inoculum could be spread from these sources. Search to date has not revealed any such carriers, however.

The fact that many diseased onions could be found in a 1/2-acre plot where sulfur at 1-1/2 tons per acre had been applied the previous fall indicates that eradication can not be obtained with sulfur in amounts which cause considerable crop reduction. These results have been confirmed by experiments to be reported elsewhere. Chloropicrin at approximately 700

pounds per acre ($560) applied in September 1939 in holes 9 by 10-1/2 inches apart but under unfavorably dry soil conditions and without a water seal did not give complete control of onion bloat. The yield of onions, however, was measurably better than the control.

In one field, part of which had been unsuccessfully treated for bloat in the fall of 1938 with chloropicrin at 350 pounds per acre, an increased yield was obtained in 1940. Weights were taken of a 1-rod row of untreated onions adjoining each side of the chloropicrin-treated plot and a 1-rod row within the treated plot for each of 10 rows. The plot weights were thus doubly paired with checks. The mean weight of topped onions per rod row of the chloropicrin-treated plot was 20.3 pounds (range 17.5-22.0) while the means of the two checks were 18.2 (15.9-21.1) and 17.7 (16.7-21.8). Since the weight of the treated row exceeded that of each of the corresponding checks in 7 cases and exceeded that of one or the other check in every case it appears obvious that there was an increased yield of onions due to soil treatment with chloropicrin nearly two years previously.

In another field, part of which had been treated with sulfur for onion bloat with apparent success in the fall of 1938, a reduced yield was obtained in 1940. Weights were taken of a 1-rod row of onions from untreated soil adjoining each side of the sulfur-treated plot and a 1-rod row within the treated plot for each of 10 rows. The 10 plot weights were thus doubly paired with checks. The mean weight per rod row of the sulfur-treated plot was 15.25 pounds (range 13.0-18.2 pounds) while the mean weights of the two checks were 16.91 (13.8-20.0) and 17.23 (14.1-18.4) respectively. The weights of the rod rows from the sulfur-treated plots were less than those of both checks in 9 cases and less than 1 check in the tenth case. Sulfur, therefore, appears to have caused some reduction in crop even in the second year after its application.

(Cornell University and Division of Nematology, U. S. Bureau of Plant Industry).

THE NEMATODE EUCEPHALOBUS OXYUROIDES APPARENTLY CAUSING DISEASE OF TOBACCO ROOTS

T. W. Graham

A survey made in the tobacco-growing counties of eastern South Carolina during June and July indicated a relationship of the nematode Eucephalobus oxyuroides (de Man) Steiner 1/ to a decay of tobacco roots.

1/ The writer is indebted to Dr. G. Steiner, Principal Nematologist in Charge, Division of Nematology, Bureau of Plant Industry, U. S. Department of Agriculture, for identification of this and other species submitted to him during the survey. Other species found included members of the Dorylaimidae (Aporcelaimus sp.), and an Aphelenchoides sp.

Affected plants were stunted, yellowed, and generally lacking in vigor. Early symptoms of infestation appeared as elongate, reddish-brown lesions 0.5 to 2 mm. in diameter. These were confined primarily to the secondary fibrous roots. Later the lesions became larger, coalesced, and turned darker in color. Advance of lesions usually resulted in girdled roots and eventually in the decay of the entire cortex tissue. This left the characteristic threadlike appearance of the remaining stelar root tissue.

Microscopic examination of 40 collections of root material indicated an almost constant association of the nematode E. oxyuroides with this decay. Although other nematodes were commonly observed, the above species was the predominating form in 30 of these collections. The remaining 10 contained various unidentified species.

The symptoms described are in general very similar to those caused by the meadow nematode, Pratylenchus pratensis (de Man) Filipjev, also known to be parasitic on tobacco roots, but are quite distinct from the effects of the common root-knot nematode, Heterodera marioni (Cornu) Goodey. E. oxyuroides differs distinctly in appearance from both the meadow and the root-knot nematodes.

As indication of its parasitic relationship, E. oxyuroides was prevalent in (1) very young lesions, (2) well-developed lesions, and (3) badly decayed roots.

Further studies on the relation of this new nematode to the tobacco root decay problem in the South Carolina area are in progress.

(Division of Tobacco and Plant Nutrition, U. S. Bureau of Plant Industry, in cooperation with the South Carolina Agricultural Experiment Station).

CROWN INJURY ON PEACH TREES IN NEW YORK

M. B. Hoffman

Peach trees, dead or dying from crown injury, were reported from several areas during the past few weeks. In many cases the trees affected had been treated with ethylene dichloride emulsion either during the fall of 1939 or spring of 1940 for the control of the peach tree borer. The question has naturally been asked whether this treatment was in any way responsible for the injury.

Orchards reporting injured trees in Tompkins, Wayne, Monroe, Orleans and Niagara Counties were visited July 10 and 11, in company with D. M. Daniel, Entomology Department, Geneva, and J. A. Evans, Entomology Department, Ithaca. Observations indicate that the trouble was initiated

by winter injury. This conclusion may seem odd because the past two winters have not been characterized by any periods of extremely low temperatures. In fact, most of the trees bore a crop in 1939 and have peaches again this year. The injury must have occurred at a time when the bark and wood of the crown were more tender than were the fruit buds. It seems to have been associated with immaturity and probably took place in the late fall or early winter of 1938.

Weather conditions for the fall months of 1938 would favor this type of injury. During September, the month in which the severe wind storm did so much damage in New England, the rainfall for New York State was heavy, averaging 7.59 inches or 4.10 inches above normal. October 1938 was warm and the warm weather continued up until mid-November. On November 7 all Weather Bureau stations in the State, except Rochester, recorded the highest temperature on record for this month. Another warm period occurred from November 17 to 22 followed by the coldest weather of the month from the 23rd to the 28th. The minimum temperatures in the fruit districts on November 26, 1938 ranged from about 10 degrees above to 6 degrees below zero F.

There is little doubt that the moisture supply during the fall of 1938 connected with the warm sunny days of October and early November delayed the maturity of certain tissues of some fruit trees and berry plants. The temperatures of late November were sufficiently low to injure tissues exhibiting only a moderate degree of maturity. "Maturity" as used here is a relative term. A severe winter such as 1933-34 takes its toll of trees from some varieties with well ripened wood. Damage from a moderate freeze coming early, before ripeness is attained, may also be great.

The injury on the peach trees in question is found at, or slightly above, the ground level, a position where maturity develops last. It usually consists of a sunken area extending entirely around the trunk. The bark, cambium and all the wood is dead. The enlargement above the injured area is further evidence that the damage was done prior to the 1939 growing season. Injury was found only in young orchards. Young trees usually grow more vigorously and later in the season than old trees; consequently, they would be more susceptible to injury caused by immaturity.

Similar injury was found on peach and prune trees in Columbia County in June 1939. In this case the orchard was cultivated quite late because it was interplanted with strawberries. The late cultivation seems to have been associated with a more severe degree of injury which showed up during the first growing season following damage.

(From New York State College of Agriculture, Departments of Entomology and Plant Pathology, Weekly News Letter Concerning Insect Pests and Plant Diseases, July 15).

ORIGIN OF OUTBREAKS OF PEACH LEAF CURL

W. D. Valleau

There appears to be much confusion about the life history of the peach leaf curl fungus Taphrina deformans. It is often assumed that ascospores must play a part in the life history of the fungus, whereas I have never found any evidence in the literature that ascospores necessarily have any part in perpetuating the fungus from year to year. The published evidence indicates that ascospores germinate very quickly after release and frequently before release from the ascus. They then form a yeast-like colony, as demonstrated by Mix, and it is this yeast living on the bark of the trees that is the source of infection the next year. The notion that ascospores are active in infection seems to be purely a carry-over from before the time of the discovery of the saprophytic gametophytic stage of the fungus. If it is recognized that there is a saprophytic gametophyte living as a yeast-like fungus on the trees at all times, and that following a cool wet spring the parasitic sporophytic stage develops in the leaves, sudden outbreaks of the disease in damp cool years in regions where the disease was previously unknown are readily explained without the assumption that a few ascospores were carried over from a previous year or had been blown in. Also, the late infections that occur on growing point leaves on new shoots of a length of a foot or more during a cool wet period late in the spring are explained without the necessity of assuming secondary infection. The text books have not kept pace with the published research on this fungus.

(Kentucky Agricultural Experiment Station).

CHECK LIST REVISION NOTES

Freeman Weiss

Black knot of Amelanchier. In the Check List of Diseases of Economic Plants in the United States (U. S. Dept. Agr. Dept. Bull. 1366) the occurrence of Dibotryon morbosum (Schw.) Theiss. & Syd. (Plowrightia morbosa (Schw.) Sacc.) on Amelanchier spp. was recorded from Minnesota and Montana. A similar record from Iowa was entered subsequently in the card file of the Plant Disease Survey. The records from Montana and Iowa were based on literature references, that from Minnesota on an unsigned report in 1918. In the current revision of the Check List a question arose as to the authenticity of these records, since D. morbosum is reported only on Prunus spp. (plums and cherries) in the Manual of Fruit Diseases of Hesler and Whetzel and in the Theissen and Sydow monograph of the Dothidiales. Furthermore, in the author's experience, as well as that of

C. L. Shear and J. A. Stevenson, who were consulted, black knot has been conspicuously absent from Amelanchier when it was found in close proximity to Prunus spp., chiefly P. virginiana or P. serotina, which were heavily infected. Pending a further study of the question, the record of this fungus on Amelanchier was omitted from the recently published section of the check list that included this genus (PDR 24: 270).

The mycological herbarium of this Division contains one specimen of this fungus on Amelanchier sp. from Mandan, North Dakota, but the collection was made when the host was leafless and its identification therefore subject to some doubt. Correspondence with Dr. G. W. Martin of Iowa State University disclosed that the university herbarium contained two collections labeled "Plowrightia morbosa on Amelanchier," both made at Okoboji, Iowa, one by B. Shimek and one by T. H. Macbride, and both determined by the latter. Doctor Martin kindly made both specimens available for examination. Dr. W. W. Diehl studied the fungus component of the specimens and concluded that it seemed to be the same species as occurs on plums, although mature perithecia were not found. Conidia and immature asci typical of the fungus as it occurs on plums were observed. Mr. W. N. Watkins of the Smithsonian Institution generously made a critical examination of the wood to see whether the host could be identified in this way. His findings support the host determinations made by the collectors. The occurrence of D. morbosum on at least one species of Amelanchier is therefore confirmed. It may be significant that all the collections of which the Plant Disease Survey has knowledge are from Northern or Western States where A. alnifolia together with A. canadensis are the commonest species of serviceberry, whereas A. alnifolia does not occur in the Eastern States (except northern New England) and other species such as A. oblongifolia, A. stolonifera and A. laevis are frequent. At any rate, the probable existence of host-specialized races of the fungus is indicated.

Additional records of the occurrence of D. morbosum on Amelanchier would be of interest to the Survey, especially if made under conditions permitting precise identification of the host. Supplementary information on black knot infection of neighboring Prunus also would be desirable.

The fungus reported as Plowrightia phyllogona Harkn. on Amelanchier alnifolia in California is the common black mildew Apiosporina collinsii (Schw.) Höhn.

Nomenclatorial comments. A correspondent sends the following comments relating to the section of the check list that includes almond and peach (Amygdalus) in Plant Disease Reporter 24: 278. 1940.

"Designation of a clearly described disease, e.g., asteroid spot, as 'undet.' or 'not clearly differentiated' is something short of ideal. At the present stage, the addition of a Kenneth Smith numeral or a Holmes binomial will be of little use to anyone ....."

" 'Yellow-red virosis' is a misuse of words. A virosis has no color."

In regard to the first comment, the use of the designation "undet." following a virus is intended to mean that the virus in question has not yet been assigned a place in a generally used system of virus nomenclature, of which the Smith and the Holmes systems are regarded as the outstanding examples. It does not imply that the disease is doubtfully of virus etiology or that the virus has not been adequately characterized. The Survey would not attempt to discriminate in the latter question, and diseases of suspected but not yet demonstrated virus nature are designated by "? virus."

The second comment incites once more the old question whether a disease (plant disease in this instance) has any physical existence as such and therefore possesses physical attributes, including color, or whether it is merely an abstract concept, the expression of a physiological relationship between two organisms or an organism and its environment. Common usage sanctions such expressions as "a disease spreads," which implies an objective existence of the disease. Common, and authoritative, medical usage approves such names as scarlet fever and yellow fever. If a fever can "have a color," why should not a virosis, which simply means a virus disease?

In this particular instance the choice lies between the name "X-disease" originally used by Stoddard and "Yellow-red virosis" proposed by Hildebrand and Palmiter. The Survey prefers the latter, since X-disease has no significant connotation.

Erratum. Attention is called to an error on page 280 of the section of the check list just referred to. Following Podosphaera, Polyporus should appear in place of merely the initial P.

(Division of Mycology and Disease Survey).

BRIEF NOTES ON PLANT DISEASES

DODDER UNUSUALLY SEVERE IN VIRGINIA: Dodder, Cuscuta sp., is more prevalent and has caused more damage in Virginia this year than it has for the past several years.

During the past 3 weeks excessive rainfall has occurred throughout the State. This has undoubtedly greatly influenced the development of dodder. One interesting feature observed is the rapidity with which dodder developed in the fields. A number of fields of lespedeza were observed that were practically free of dodder a week ago; however, at the present time about 75 percent of the plants are affected.

In a number of lespedeza fields from 75 to 100 percent of the plants are diseased. In many cases farmers are mowing their lespedeza when it is less than one-half grown in an attempt to check the spread of the dodder.

The uniform distribution and rapid spread, even on new land and from supposedly clean seed is difficult to explain. (S. B. Fenne, Extension Plant Pathologist).

POWDERY MILDEW ON ROSE IN CONNECTICUT: Powdery mildew [Sphaerotheca sp.] on roses is acting strangely in the New Haven Rose Garden this year. The Dorothy Perkins variety is normally considered one of the most susceptible of all varieties. This variety is clean this year, whereas mildew is very severe on practically all the other varieties in the rose garden. Moreover, the ordinary applications of wettable sulphur sprays are not giving commercial control as expected. (James G. Horsfall, September 5. Connecticut Agricultural Experiment Station).

AUGUST WEATHER

(From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for week ending September 10).

The temperature for August averaged moderately higher than normal in most sections of the country, with precipitation abundant in Central and Eastern States and decidedly deficient in the West. Temperatures averaged somewhat below normal from Virginia northward to Pennsylvania and southern New York, in the west Gulf States, and near normal, mostly slightly below, in the trans-Mississippi States. Otherwise, the means were above normal, with the greatest plus departures from the northern Great Plains westward to the Pacific Ocean and the central Great Basin. In the latter area the month was 6° or 7° warmer than normal.

Figure 1 shows that August precipitation was deficient in New York and New England, Indiana, Kentucky, South Dakota, Nebraska, Mississippi, and Alabama. Otherwise, the amounts were above normal in all States from the Great Plains eastward. From the Rocky Mountains westward moisture was markedly deficient in most areas.

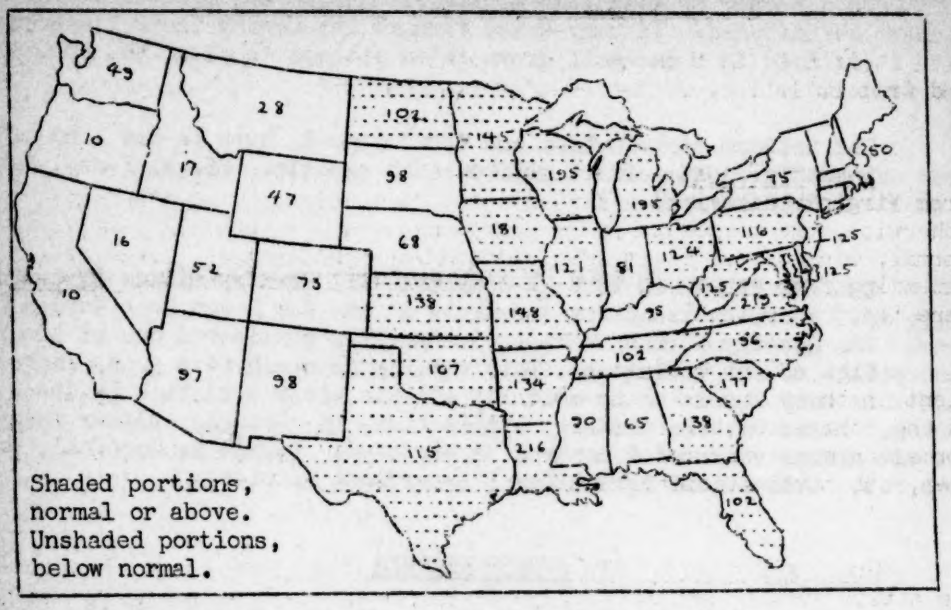

Fig. 1. Percentage of normal precipitation, by States, August 1940.

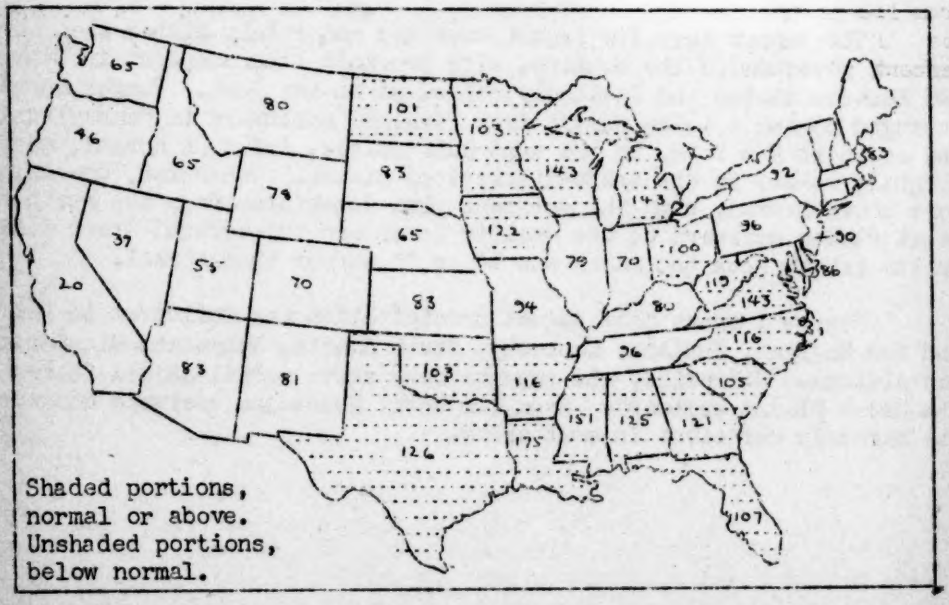

Fig. 2. Percentage of normal precipitation, by States, June - August 1940.

THE SUMMER AND THE GROWING SEASON OF 1940

(From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for week ending September 10).

Summer of 1940: The summer of 1940 was slightly cooler than normal from Virginia northward and northeastward and in most of the South. Otherwise, the temperature for the 3 summer months (June-August) was above normal, markedly so in the western half of the country. Over a belt extending from South Dakota to Nevada the mean temperature was from 4° to more than 6° above normal.

Figure 2 shows that precipitation for the summer was somewhat deficient in the Northeast, the central and western Ohio Valley, Missouri, and in the central Plains States. Otherwise the amounts were generally above normal throughout the central and eastern portions of the country. However, substantial deficiencies are shown from the Rocky Mountains westward.

Growing Season of 1940: For the 6 months, March-August, comprising the active growing season of 1940, precipitation was above normal in most States from the Mississippi Valley eastward, although there were substantial deficiencies in the western Ohio and lower Missouri Valleys and the central Great Plains. The State average rainfall for the season ranged from 142 percent of normal in Louisiana down to 67 percent in Nebraska. West of the Great Plains there was a general deficiency. Utah, with 68 percent of normal, was the relatively driest Western State.